



Fingerprint Visualisation on Lidl Receipt Paper

Forensics & Identity Team

DSTL/TR149182

Release Conditions

This document was produced by Dstl for Home Office Science and Technology Commissioning Hub under Service Level Agreement DSTLS/880 (Provision of Science and Technology Support between Defence Science and Technology Laboratory (Dstl) and The Home Office). Copying and use of the document is restricted to that set out in the above Order/Contract and the document may not otherwise be used or disseminated without the consent of Dstl.

© Crown Copyright 2023

Defence Science and Technology Laboratory UK

Approval for wider use or release must be sought from:

Intellectual Property Group
Defence Science and Technology Laboratory
Porton Down, Salisbury, Wiltshire SP4 0JQ

Lidl Receipt Paper - Guidance

Environmentally friendly materials are becoming more commonly selected by manufacturers and retailers. An example is the new Lidl supermarket receipt, which has been available in some regions of the UK since March 2021 [1]. It is believed that this style of receipt is produced on “Koebler paper” [2] and is made without chemical colour developers. Instead bubbles of ink are contained within the paper which are released when heated. It is advertised to be “oil and water resistant” and “can be recycled with wastepaper” (Figure 1).

This new style of receipt can be identified by its Lidl branding and blue colour on the printed side. The printed side is susceptible to damage, resulting in black marks on the surface therefore careful storage and handling is required.

Dstl carried out experiments on these receipts to determine if routine fingerprint visualisation processes would be suitable. The advice presented here was generated from the results of these experiments and should be used in conjunction with the Fingerprint Visualisation Manual (FVM).

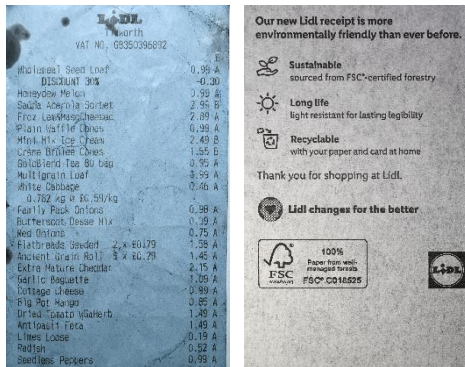


Figure 1. Example images of the front (left) and back (right) of the new style Lidl receipt.

Key recommendations for optimal contrast:

- FVM Chart 2 Porous
- Indandione
- Process without a Fingerprint Development Oven
- Do not use Thermal Coating Removal (acetone wash)

This study highlighted that the FVM guidelines for porous substrates [3] is the recommended sequence for this new style of receipt paper (Figure 2), but with additional considerations.

It was observed that processing within a Fingerprint Development Oven (FDO) darkens the paper, in particular when subjected to the oven conditions for Ninhydrin (Figures 3 & 4). Therefore, when Lidl receipt paper is processed, the best contrast is achieved with Indandione (Figure 5) due to the fluorescent fingermarks produced. Greater contrast may be achieved between the fingermark and the background if left to develop in the dark without the use of a Fingerprint Development Oven [3].

Due to differences in production for this new style of receipt, the FVM thermal coating removal process (acetone wash) is not recommended. Acetone washing does not remove the printed writing on the receipt (Figure 6). The printed side turns black in the acetone and returns to partly blue when dry, with dark marbled-effect staining. Repeated dips in the acetone wash causes the printed side to darken further (Figure 7).

Processing Lidl receipt paper with Physical Developer was also effective at visualising fingerprints and Infrared (IR) Reflection may be used to provide better contrast between the fingerprint and the substrate.

[1] <https://www.abettertomorrow-lidl-ni.co.uk/news/the-new-lidl-receipt/>
 [2] <https://chemsec.org/publication/investors/look-ahead/>
 [3] Fingerprint Visualisation Manual Second Edition (2022), ISBN 978-1-3999-0976-1 Home Office and Dstl

Chart 2 Porous

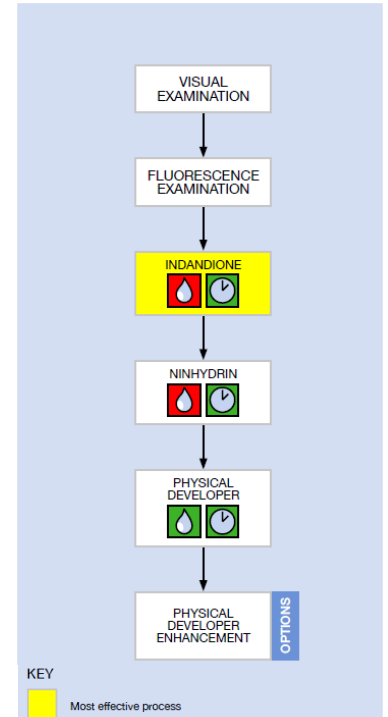


Figure 2. FVM (2nd Ed) Chart 2 Porous, page 4.29. This is the recommended sequence for Lidl receipt paper, however without the use of a Fingerprint Development Oven.

Lidl Receipt Paper – Examples

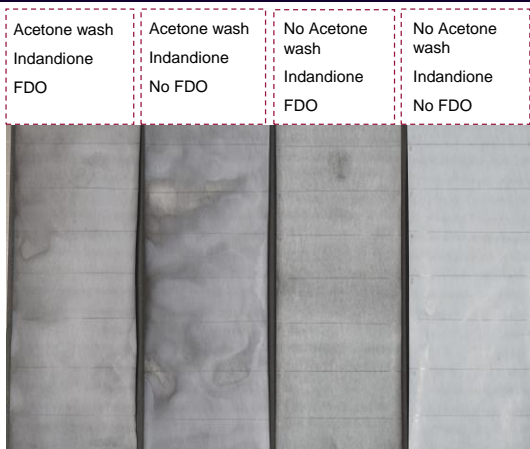


Figure 3. Examples of Lidl receipt paper following Indandione processing as described above. The most successful processing method was no Fingermark Development Oven (FDO) and no acetone wash. Slight darkening was seen following FDO processing and a darkened marble-effect was seen following the Acetone wash.

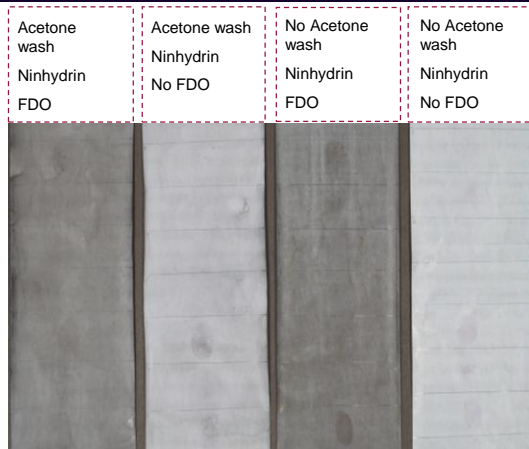


Figure 4. Examples of Lidl receipt paper following Ninhydrin processing as described above. The most successful processing method was no FDO and no acetone wash. Significant darkening was seen following FDO processing and a darkened marble-effect was seen following the Acetone wash.



Figure 6. Example of Lidl receipts processed with acetone wash and Indandione (left) and Indandione only (right). Both receipts were left to develop in the dark (no FDO).

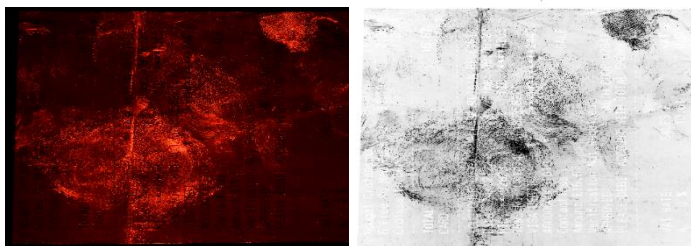


Figure 5. Example of a Lidl receipt paper following Indandione processing and left to develop in the dark without the use of a FDO. Left – green fluorescence (light source 490-560 nm, viewing filter 571nm), Right – black and white, inverted.

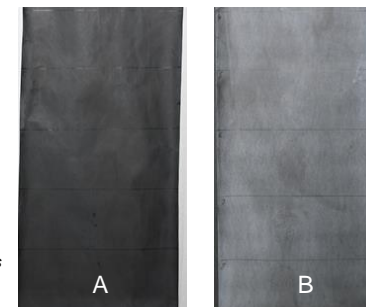


Figure 7. Examples of Lidl receipt paper following acetone wash and Ninhydrin then processed within a FDO. A - Reprocessed several times in the Acetone wash. B - Processed once in the Acetone wash.

Enquiries

Please direct all enquiries to the following central mailbox: FI_Enquiries@dstl.gov.uk

Note: The Dstl email system does not send out of-office replies. To avoid delay to enquiries that are time-critical, please ensure that the central mailbox is used in preference to individual staff mailboxes.

Address

Dstl, Porton Down, Salisbury, Wiltshire, SP4 0JQ, UK

Home Office Commissioning Hub

This fingerprint visualisation research has been funded by the Home Office. If you have a new work requirement that you would like the Dstl team to explore, please contact the Home Office Commissioning Hub, who are responsible for tasking Dstl on behalf of the UK Home Office & Law Enforcement; their email address is:

CommissioningHub@homeoffice.gov.uk

The information provided in this technical bulletin is to the best of our knowledge factually correct and accurate. In no event shall Dstl be liable for any loss, claim, damages or liability, of whatsoever kind or nature, which may arise from or in connection with the use of, or dependence on, any advice or information provided in this technical bulletin.